Comments on CC Docket No. 94-102
By
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19/06/00

Deaf Europeans have viewed the United States Baudot only Solution to the mobile phone problem with some alarm. It has taken some effort to explain that there are four different types of mobile phones and that this access issue is really only dealing with the necessity to reach the emergency services of 911 for deaf, deaf blind and voiceless American within their own country.

My name is Andrea J. Saks and I am a United States citizen residing in the United Kingdom. I have been someone who has been in deaf telecommunications internationally for over thirty years. I have also has been on many US State Department delegations to ITU for the purpose of advising delegates on Deaf telecommunications since the early 90's. I feel compelled to comment on CC Docket No. 94-102.

While it is clear the GSM mobile phone system in Europe is different than the systems used in the USA, many Europeans have communicated that this approach of using only Baudot through the voice channel is very isolationist. Even though there is an understanding of the technical problems behind this possible decision, there is a fear that this decision will cause future problems and incompatibility in the future. This is feeling especially true in the United Kingdom where British Telecom has nearly finished the final testing of Text Direct. TextDirect is an International Gateway system designed for Text telephony using the ITU standards of V.18 and T140. It allows us for the first time to have real international compatible text phone communication worldwide. TextDirect will allow some mobile phones to communicate with the varying different text phones mapped out in the ITU standard of V.18. It certainly allows direct access to Emergency services and TRS. This will be inaugurated in October of this year. The British Deaf don't fully understand why such a large technologically advanced country such as ours cannot do the same.

It is recognized that there is a humanitarian issue and a legal requirement to meet the FCC mandate to make it possible for direct communication to 911 for text telephone users over the mobile networks as soon as possible. We have been told that this is temporary solution. If that is the case then this solution should be formally recognized as a temporary solution to an American problem of text phone access via the mobile telephone network to the emergency service of 911 only.

It should not be recognized as a long-term solution to mobile phone accessibility in US. It should not imply or create the misunderstanding to the telecommunications industry of providers that they have completed all that is necessary for the text telephone user. It should be clearly stated the complete obligation for equal access is not complete until V.18 and T140 gateways are implemented into the mobile network

using the data channel with those gateways and that it will allow universal accessibility to all mobile phone users both deaf hearing and voiceless alike.

Global compatibility is extremely important to all of us and does not exist for the mobile phone network as it stands now regardless of Deaf access. Perhaps Deaf telecommunications could be the key to solving that. It would not be the first time that Deaf telecommunications solved a telecommunication issue for the Hearing. In the mid 70's, I was able to gain a one-day waiver on a FCC docket that prevented data transmission across the transatlantic voice lines to allow the first Deaf Transatlantic Call. That waiver was the beginning of the crumbling of the lease line stranglehold as the only way data could be transmitted transatlantically across the direct dialed voice network. Because of the deaf, data was seen as personal communication as well as business communication.

V.18 Gateways provided by the industry are the key to real accessibility. Hardware changes too frequently to be practical long term. I have attached the British Telecom document regarding Text Direct to illustrate this point and show what is technically possible. It also works with their form of TRS and improves accessibility to the relay service. TextDirect is also important as a model to show that accessibility has to be done at the network level. There has been too much work done by IETF and ITU on the inclusion of deaf telecommunication into Gateways for the future accessibility to IP from PSTN using V.18 with T140. These gateways include mobile telephony.

No one wants to prevent Americans access to 911 as quickly as it possible. However this particular solution should be recognized as only stop gap until the real long-term solute can be implemented using the data channel with gateways using V.18 and T140.

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attachment

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BT TextDirect

Comment on Docket No. 94-102

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Contents

1. Introduction **7**
1.1 Purpose of this document 7
1.2 Quick History Lesson - How did we get here? 7
1.3 Principle 7
1.4 Features 7
2. TextDirect - Terminals and Telephone Numbers **8**
2.1 The Method of Access 8
2.2 What Types of Terminal Can Be Used 8
2.3 Access Codes New and Old 9
3. Call Set-up and Call in Progress **11**
3.1 Textphone Call Set-up 11
3.2 Telephone Call Set-up ☎ 16
3.3 Conversation in Progress 19
4. Billing **22**
4.1 The Changes to Billing 22
4.2 The Text Tariff *(BT)* 22
4.3 The BT Telephone Bill (BT) 23
4.4 When Does Call Charging Start 24
4.5 Billing Enquiries 25
5. Other Networks and Operators **26**
5.1 UK Networks 26
5.2 International Calls 26
6. Other Services **27**
6.1 Calling Line Identification 27
6.2 Caller Display Equipment 27
6.3 Caller Return 27
6.4 Text 999 112 Emergency Calls 27
6.5 The 100 Operator 28
6.6 Directory Enquiries (192) 28
6.7 Free Directory Enquiries (195) 28
6.8 IVR and Answer Machines 28
6.9 Carrier Pre-Selection 28
6.10 Call Barring 28
6.11 Incoming Call Facilities 28
7. Glossary Of Terms **29**
8. Document Information **30**
8.1 History 30
8.2 Author 30

1. Introduction

1.1 Purpose of this document

This document describes principles behind the operation of TextDirect. It is not written as a user guide but more as a description the facilities and function the service will provide and how a user will interact with them. TextDirect is described as it is at present, the user trials are certain to recommend some changes. The document assumes that the reader is already conversant with the principle of text communications. Sections with particular interest to textphone users are marked by the 📠 symbol while those aimed at voice users are marked by the ☎ symbol.

1.2 Quick History Lesson - How did we get here?

For more than thirty years textphone users have been making calls through the Public Switched Telephone Network (PSTN). The PSTN has been designed for voice based communications and for a textphone user it provides no feedback other than the call progress tones which have to be interpreted by their textphone. The PSTN has increased in complexity over the years and as a result has needed to move from tone based feedback to voice messages which are more easily understood by the users. These voice messages are of course not available to a textphone user who is deaf. Along with the problem of network messages comes the inability of some textphones to talk to other textphones. Three years ago BT's Age & Disability Unit set about solving these problems in order to provide equality of access to the PSTN. At the same time Typetalk - The National Text Relay Service was considering the problems of users having to log on to the Typetalk service and long call set up times. It became apparent to both groups that they were looking for the same solution; the concept of TextDirect was born. The service was originally known as the VTN or Virtual/Voice Text Network and has been re-named TextDirect.

1.3 Principle

The ideal solution would be for any telephone call through the PSTN to be identified by the PSTN as being a text call and for it to be dealt with as a text call, however this proved to be impracticable. TextDirect works on the principle of routing all calls that will or could involve text communications through a node in the PSTN. This node knows about text and can react to text calls. In practise to allow a higher level of robustness this single node is actually two nodes that act as one. The calling party will dial an access code followed by the telephone number they wish to contact. The access code routes the call to TextDirect which then connects the calling party to the number they dialled. Messages from the network will be passed to the calling party in an appropriate format i.e. text for a textphone user and voice for a voice user. As a result of TextDirect's ability to detect text communications comes the facility whereby a relay operator can be connected into a call as and when required.

1.4 Features

Below is a list of TextDirect's facilities with a brief description that will be expanded in subsequent sections:

- Just dial - Textphone users will use TextDirect for all calls, there will no longer be a difference between a back to back call and a relay call.
- Registration and logging on - There will be none. With TextDirect a caller just dials the access code and telephone number they want as one number.
- Billing - All chargeable TextDirect calls will appear on the caller's telephone bill from their Service Provider. Typetalk will no longer produce a telephone bill.
- Network messages - TextDirect will provide network call progress messages in a format compatible with the caller's textphone, or in voice for a voice caller.
- Relay - TextDirect will provide, at any point in a call, automatic access to a Typetalk operator.
- Compatibility - TextDirect will provide protocol conversion between incompatible textphone protocols.
- Text User Rebate Scheme - Calls will be charged at source using a text tariff and this tariff will be available to **all** BT residential customers.

2. TextDirect - Terminals and Telephone Numbers

2.1 The Method of Access

TextDirect is accessed on a per call basis rather than having a telephone line set up to automatically connect calls via TextDirect. This approach has been taken in order to allow textphone users to be able to access TextDirect from any telephone line without having to register that line for TextDirect access. A caller will prefix the telephone number they are calling with the TextDirect access code. TextDirect will not require a pause between the access code and the telephone number so the complete access code and telephone number can be stored in a telephone or textphone memory. The exception to this will be where the call is to be billed by someone other than the caller's Service Provider as in the case of Carrier Pre-Selection where the carrier access code will have to be dialled first.

2.2 What Types of Terminal Can Be Used

TextDirect supports conversations that use text, voice or text and voice. To be technical all these are analogue signals within the telephony speech band. It will not support any digital standard such as ISDN or ADSL except when the analogue voice channels are being used. TextDirect will not support calls from fax machines. This section describes the various telephone terminals and how they can be used with TextDirect.

2.2.1 The ITU-T V.18 Recommendation

The V.18 textphone recommendation is relatively new and was devised to overcome the incompatibilities between the various textphones protocols. As well as having a native V.18 protocol used to communicate between V.18 devices it also provides backward compatibility with existing textphones. The modems within TextDirect are fully V.18 compliant. However initially for calls within the UK the DTMF text communication protocol has been disabled as it is felt that there is potential for confusion when automatic detection is used.

The textphone protocols supported by TextDirect are:

- Native V.18
- V.21
- V.23
- Baudot
- EDT
- Bell 103
- DTMF (Internationals calls only)

More information about the V.18 protocol is available from the ITU at:
http://www.itu.org/http://www.itu.org/

2.2.2 Textphones

TextDirect will work with all the textphones currently being used in the UK that are compatible with V.18. TextDirect will not only work with UK textphones but will also allow UK textphones to communicate without the user having to specify a protocol in advance.

In order to facilitate communications TextDirect will ask calling, called parties for the type of textphone they are using. This information is not essential, however if TextDirect knows the textphone type then any text communications can be formatted for that textphone. The formatting provided will be character translation i.e. the '£' being converted to "Pound" if the textphone can not display the symbol, or if the textphone has a twenty character display then the transmission of the text will be slowed down to allow it to be read. This request for textphone type will be sent when the conversation is about to start.

2.2.3 Computer Modems

The V.18 modems within TextDirect support two protocols that are widely used by computer modems namely V.21 and V.23. The call set up process will be greatly facilitated if the calling modem can be forced into either V.21 or V.23. Unfortunately there is no standard command to performing this operation.

2.2.4 Mobile Textphone Users

The GSM mobile network supports data communications and this method could provide text communication in the same way as computer modems.

2.2.5 Voice Telephones

TextDirect will work with all telephone terminals that communicate using voice. This includes the normal 2-wire telephones at home and in the office, payphones, mobile phones, cordless and telephones connected to ISDN or ADSL phone lines.

2.3 Access Codes New and Old

Note: The examples below use the new telephone numbers that are valid after 22 April 2000.
The TextDirect access codes perform two functions firstly it is used by the PSTN to route the call to TextDirect, secondly TextDirect uses it to identify the type of terminal the caller is using i.e. textphone or telephone.

2.3.1 The Existing Typetalk Access Numbers

When TextDirect opens for public use the current Typetalk text access number, 0800 959598, will be divert to TextDirect. The call set up procedure for calls using the Typetalk number will be the same as it is now with TextDirect asking for terminal type, account number, telephone numbers, etc. Once the call is connected then the TextDirect facilities will be available to the caller. The approach of using TextDirect but still asking for the call information has to be use because it is considered to be inappropriate for BT to charge for a call when the caller has dialled an 0800 number. As now Typetalk will be charging the customer for the call using the existing Typetalk billing process. The current plan is to stop the old Typetalk access numbers at the end of March 2001.

After TextDirect is switched on callers to the Typetalk voice access number, 0800 515152, will receive a voice message explaining that they should re-dial using the TextDirect Voice Access number.

2.3.2 Textphone Users

A textphone user will use TextDirect for all their textphone calls. There will no longer be the need to decide whether it is a back to back textphone call or a relay call the same access code is used for both. Of course there is nothing to stop a textphone user calling direct, i.e. without going through TextDirect, however they will lose the facilities such as call progress information in text and the text tariff.

The TextDirect Text Access Code will be 18001. If a textphone user wants to call a number such as 02074069653 then the number they will dial will be 1800102074069653. There is no need to pause after the access code, these numbers can be stored in the memory of a textphone or telephone.

As the access number and telephone do not require a pause it may be easier to think of the whole number as being the person's telephone number. This will mean that when a textphone user gives their telephone number to a voice user they will be able to give it as a complete number, voice access code followed by their normal telephone number, i.e. 1800202074069653. It is important to remember that it must be the TextDirect Voice Access Code that they give not the TextDirect Text Access Code that the textphone user dials. If a voice user dials the TextDirect Text Access Code the call will fail when TextDirect tries to connect a modem to the calling textphone. Below is an example of a business card for a textphone user that shows how a person's telephone numbers could be set out:

BT Age & Disability	Telephone	18002 (020) 7406 9653
Burne House	Textphone	18001 (020) 7406 9653
pp9.05	Fax	(020) 7724 8232
Bell Street		
LONDON		
NW1 5BZ		

2.3.3 Voice Users and Telephone Numbers ☎

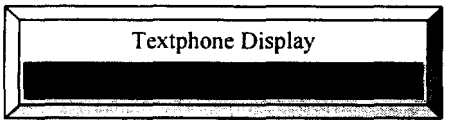
For voice users the TextDirect access code will be 18002. Voice users should use TextDirect when they wish communicate with a textphone user or when they think there is the possibility that the call may be answered by a textphone user as in the case of a household of people with mixed ability i.e. textphone and voice users.

As with the textphone user a voice caller will dial the TextDirect Voice Access Code followed by the national number so that 02074069653 will become 1800202074069653. As mentioned before these numbers can be stored in the memory of a textphone or telephone as there is no need to pause after the access code.

3. Call Set-up and Call in Progress

There are two types of caller that will make a call through TextDirect the textphone user and the voice user. This section describes the call set-up for each of these then in section 3.3 there is a description of how TextDirect will handle a call when the conversation is in progress and how a call can change modes. The details contained within this section will change as a result of the ongoing user trials. However it is more likely to be the messages to the users that will change rather than the actual principle of the operation.

The diagrams that follow contain a representation of the textphone display as below:



Unlike voice communication where it is possible to distinguish between two voices text typed by one person is indistinguishable from another. This means that where a voice caller can easily recognise a network voice announcement, a textphone user would not be able to tell the difference between text from TextDirect and text from the distant party. The prefix "TXD" is used to indicate that the message is coming from TextDirect and not the distant textphone. All messages from TextDirect will be limited to twenty characters so that they can be read on the smallest textphone display without the user needing to scroll.

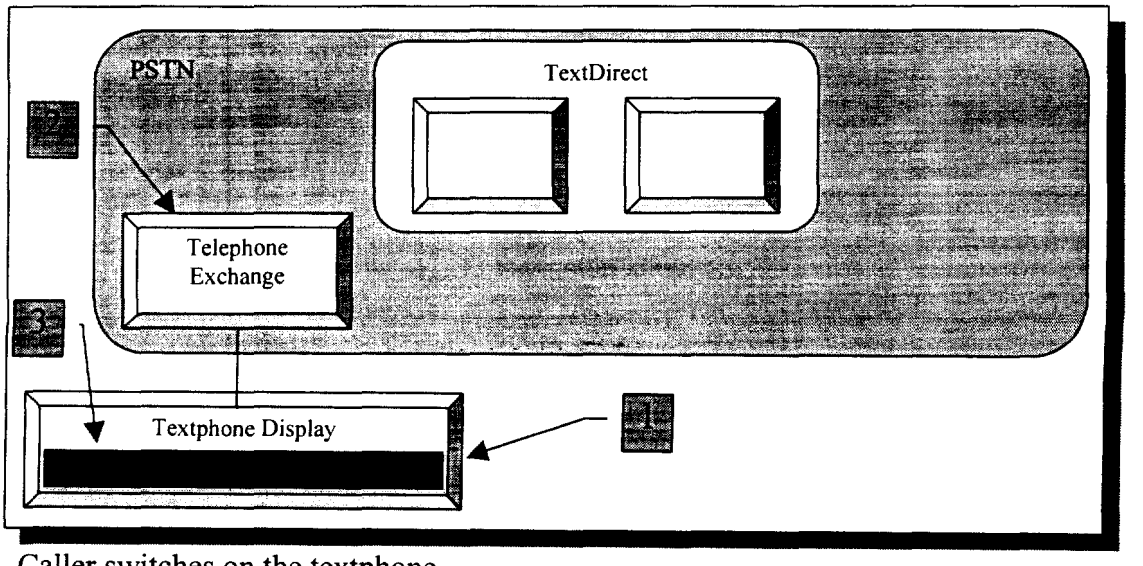
The descriptions of call set-up below reflect the current position concerning relay provision. At present there is only one relay service, Typetalk, however this could change in the future and TextDirect can support more than one relay service.

3.1 Textphone Call Set-up

The diagrams below show the basic call set-up for a call made by a textphone user. This is a generic description of how a textphone user will interact with TextDirect and does not attempt to describe the way a particular textphone will work.

In the descriptions below the progression of the call is shown as a step by step operation. This is not exactly how TextDirect works as it is capable of performing two operations simultaneously. For instance TextDirect does not have to wait for one party to enter their terminal type before performing an operation at the other end.

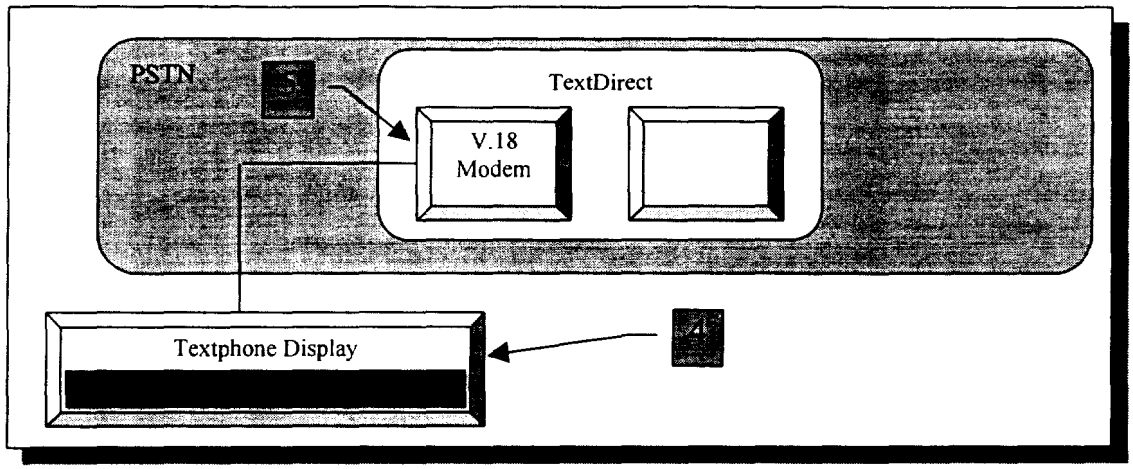
3.1.1 Caller Switches on Textphone



1. Caller switches on the textphone.

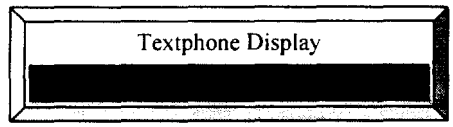
2. The local telephone exchange recognises that the caller wants to make a call. At this point the exchange does not know it is a textphone and the standard audible dialtone is returned.
3. The textphone may recognise audio dialtone and show a message on the display.

3.1.2 Dial the Access Code and Telephone Number



4. The caller dials the TextDirect Text Access Code immediately followed by the telephone number they wish to call. There is no need for any pause between the access code and the telephone number so this could be stored in the memory of the textphone or the telephone in the case of an acoustically coupled textphone.
5. When the telephone exchange sees the TextDirect access code it will connect the call through to TextDirect. TextDirect then recognises the Text Access Code and connects a V.18 modem into the call. The modem establishes text communications with the calling textphone.

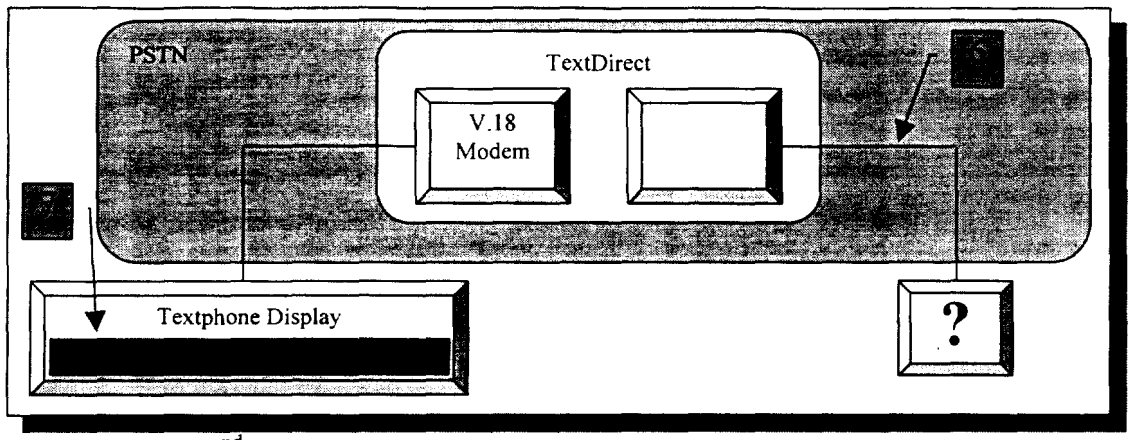
If the textphone is using one of the non-carrier based textphone protocols such as Baudot then the modem will need some characters to be typed by the user in order to detect the protocol being used. To prompt the user the message below will appear on their textphone display.



With most UK textphones it is unlikely that users will see this message as the textphones will switch to a carrier based protocol such as V.21 or V.23. V.21 will be the preferred means of connection if a textphone does not support V.18.

3.1.3 Connecting to Called Telephone Number

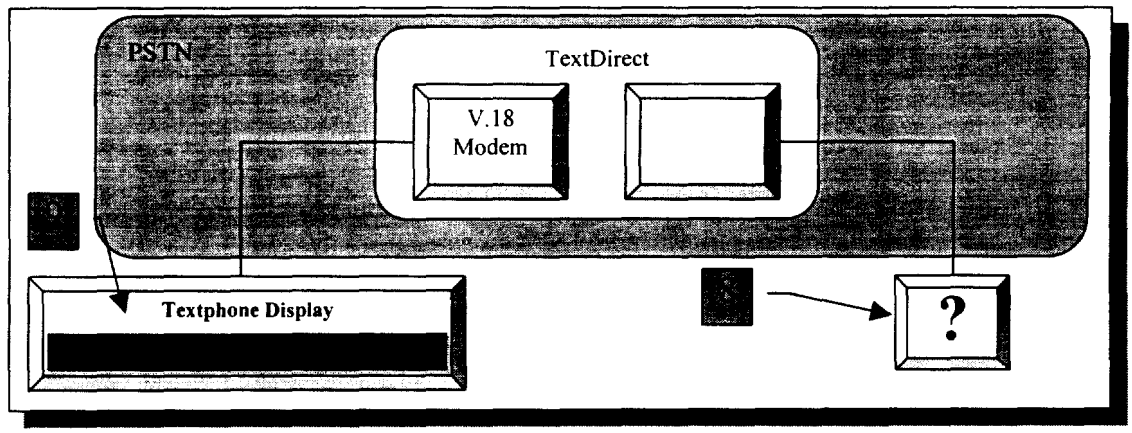
6. Once TextDirect's modem has confirmed that a textphone is calling it then



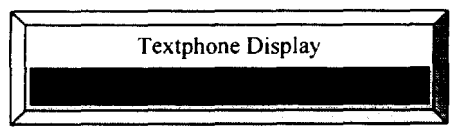
connects the 2nd leg of the call to the required number.

7. TextDirect sends a message back to the caller informing them that the call is being made.

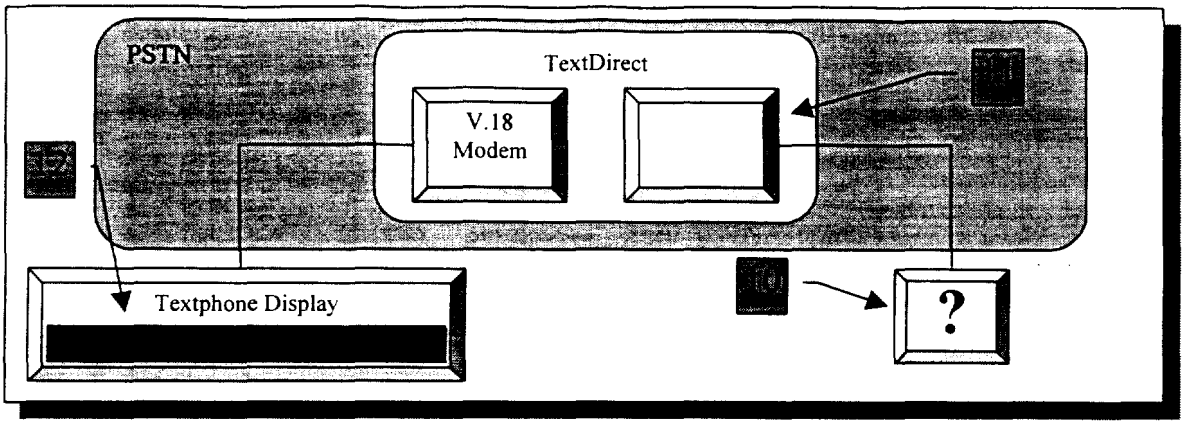
3.1.4 Ringing



8. Call is connected through to the called telephone and that telephone 'rings'.
9. TextDirect sends a message to the caller indicating that the telephone they are calling is ringing. If the telephone is busy then the caller will receive the message below:



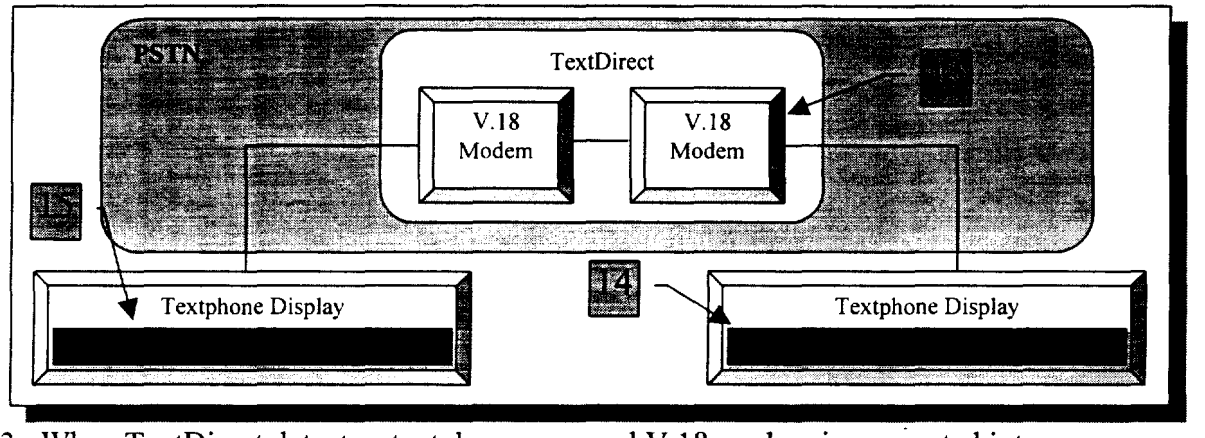
3.1.5 Textphone or Telephone?



10. The called phone answers the incoming call.
11. When the call is answered TextDirect has to decide whether or not there is a textphone present.
12. While TextDirect is looking for a textphone at the distant end the caller is asked for their terminal type. This terminal type is used by TextDirect to configure the system.

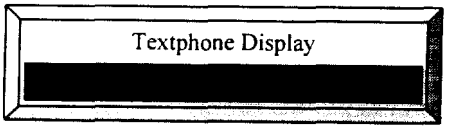
At this point in the call set-up there are two options either the called party has a textphone which results in the call connecting in Back to Back Mode (see 3.1.6), or if there is no textphone then the call will connect in Relay Mode (see 3.1.7).

3.1.6 Connecting a Back to Back Call



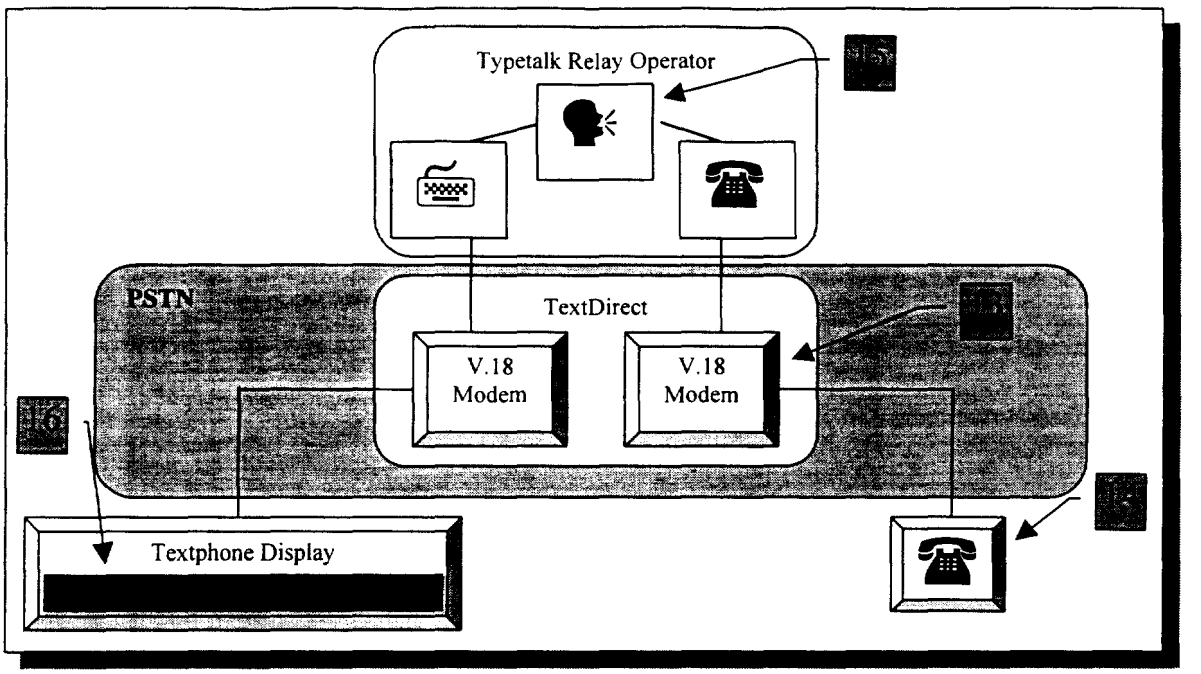
13. When TextDirect detects a textphone a second V.18 modem is connected into the call.
14. TextDirect then asks for the terminal type as it did with the calling textphone.
15. TextDirect sends a message to the caller to tell them the call is being connected in text.

Once the called party has entered their textphone terminal type they will receive the message below and the conversation can start.



The call will continue in Back to Back Mode.

3.1.7 Connecting a Relay Call



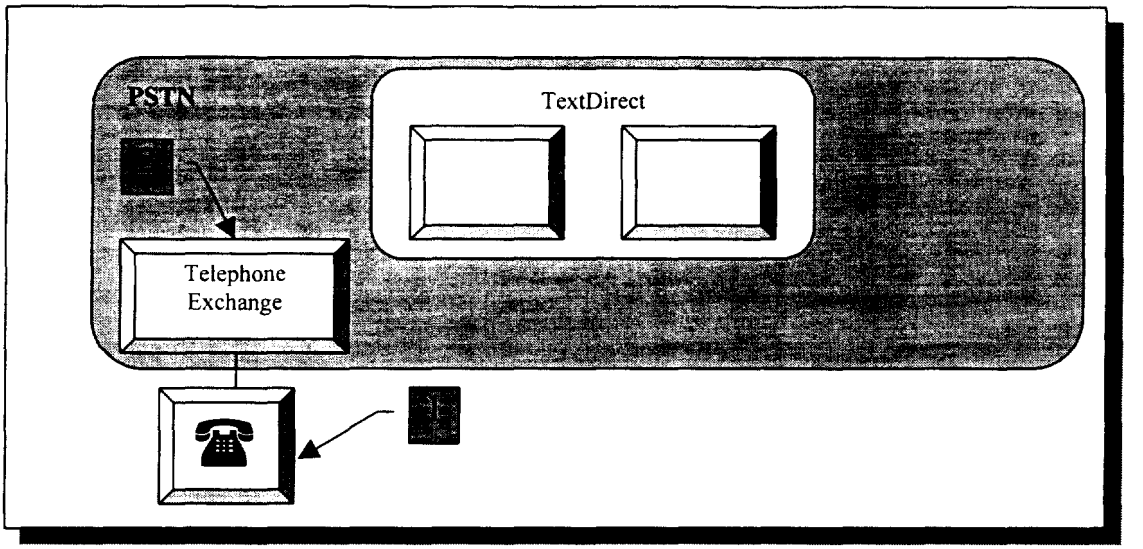
13. If TextDirect was unable to detect a textphone answering the call it will automatically connect a Typetalk operator into the call. The next two stages happen simultaneously while the Typetalk operator is being connected into the call.
14. The called party is played a recorded voice message telling them that they are being connected to a Typetalk operator and asking them if them have used the service before. If they are new to the service then they will receive instruction on how the service works.
15. While a Typetalk operator is being connected the caller will receive a message telling them that the call is going to be connected via a Typetalk operator.
16. An available Typetalk operator is connected into the call. This Typetalk operator will remain associated with the telephone call until they are no longer required.

With the Typetalk operator in place the conversation can take place. The call will continue in Relay Mode.

3.2 Telephone Call Set-up ☎

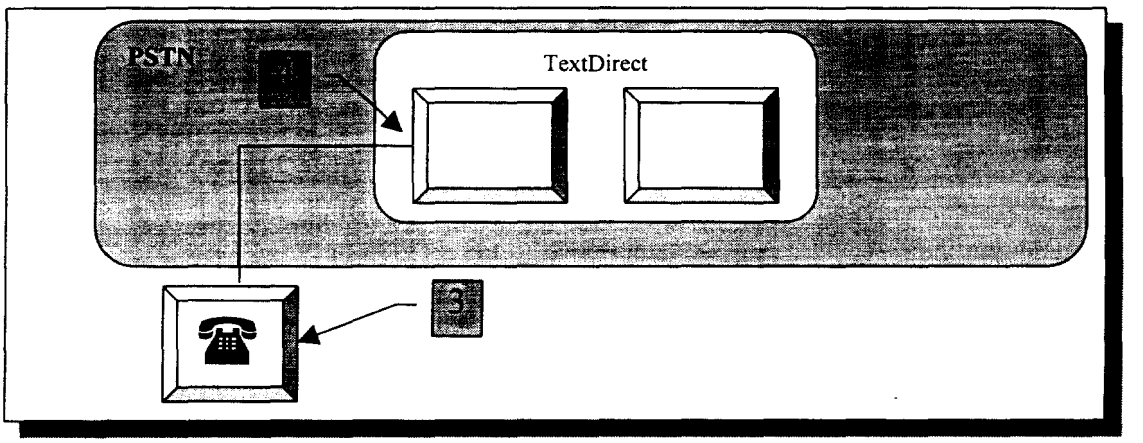
The diagrams below show the basic call set-up for a call made by a telephone user.

3.2.1 Caller Lifts the Handset



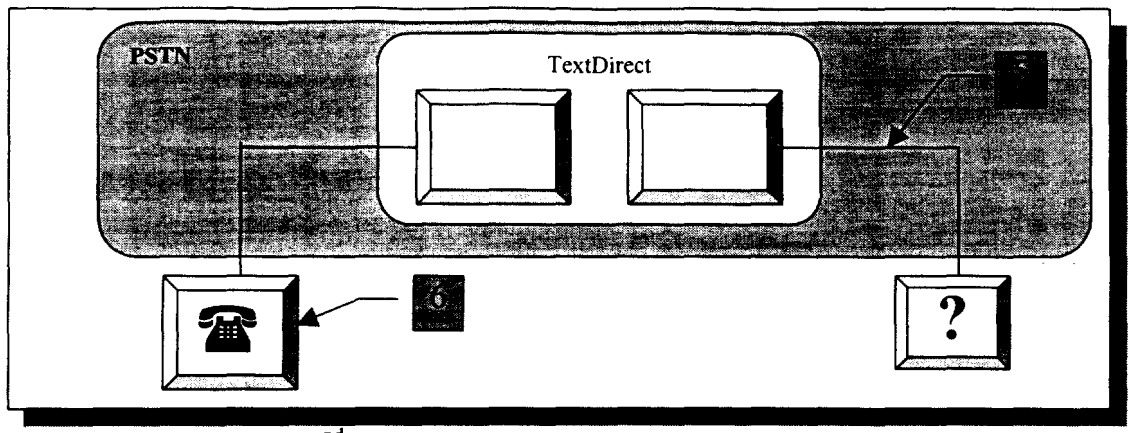
1. Caller lifts handset of telephone.
2. The local telephone exchange recognises that the caller wants to make a call and the standard audible dialtone is returned.

3.2.2 Dial the Access Code and Telephone number



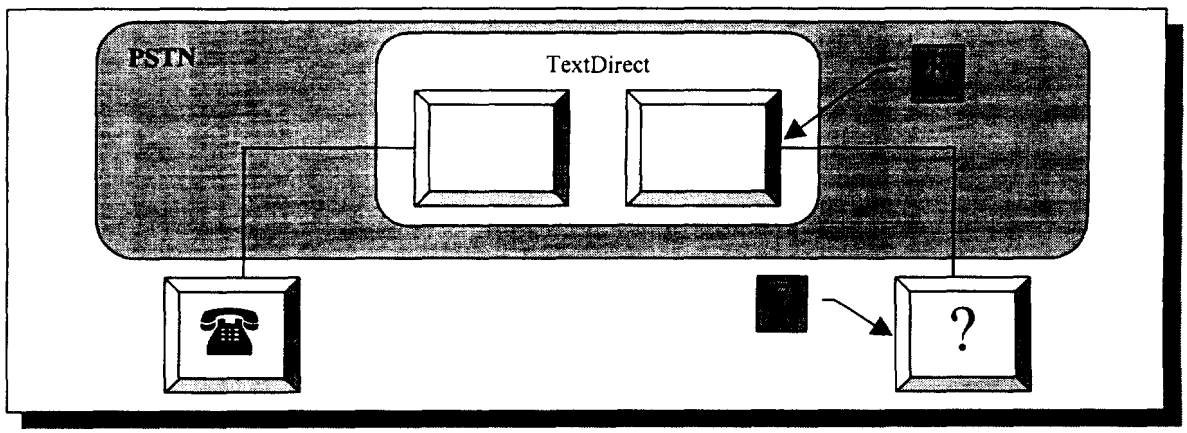
3. The caller dials the TextDirect Voice Access Code immediately followed by the telephone number they wish to call. There is no need for any pause between the access code and the telephone number so this could be stored in the memory of the telephone.
4. When the telephone exchange sees the TextDirect access code it will connect the call through to TextDirect. TextDirect then recognises the Voice Access Code and does not connect it to a V.18 modem.

3.2.3 Connecting to Called Telephone Number



5. TextDirect makes the 2nd leg of the call to the required number.
6. Call is connected through to the called phone and the caller hears ringing or busy tone. If the called number is busy then the caller will hang-up.

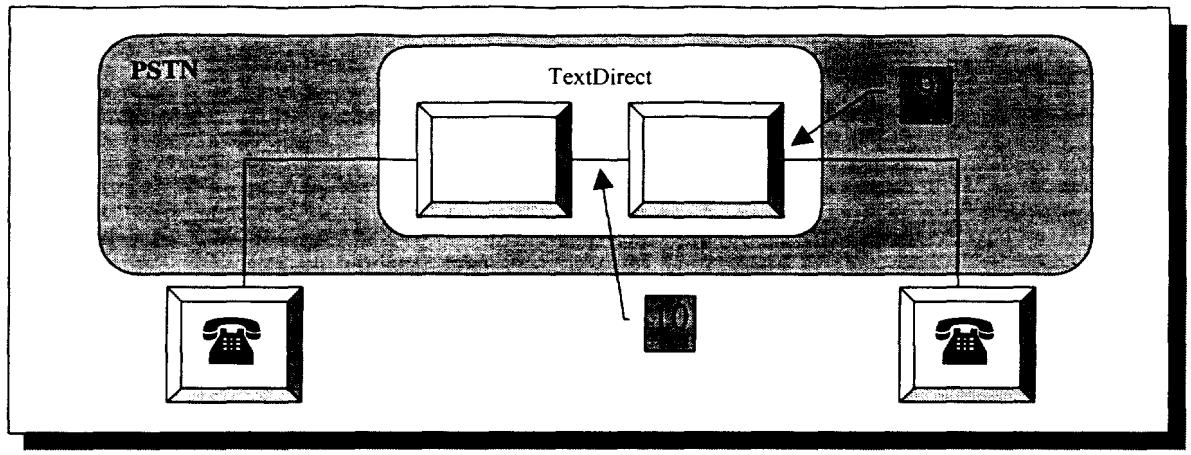
3.2.4 Textphone or Telephone?



7. The called telephone answers the incoming call.
8. When the call is answered TextDirect has to decide whether there is a textphone present or not.

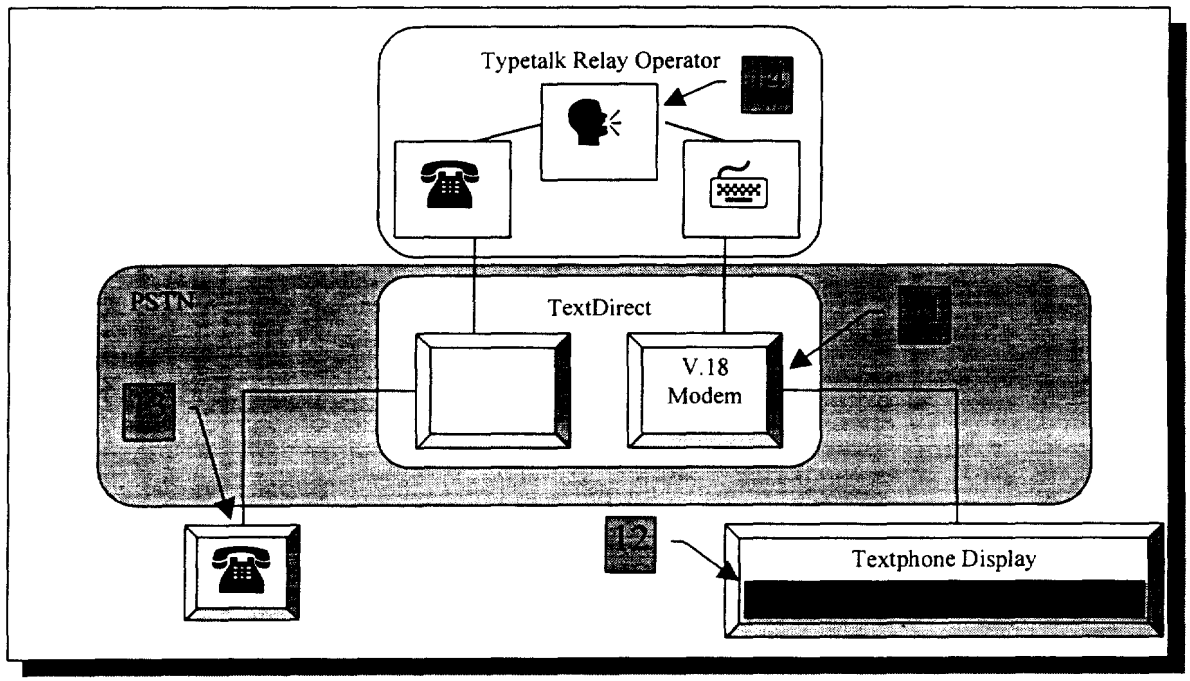
At this point in the call set-up there are two option either the called party has a telephone which results in the call connecting in Voice Mode (see 3.2.5), or if there is a textphone then the call will be connected via a relay operator (see 3.2.6).

3.2.5 Connecting a Voice Call



9. When TextDirect fails to detect a textphone then the call is connected straight through.
10. Both parties are connected together and the conversation starts.

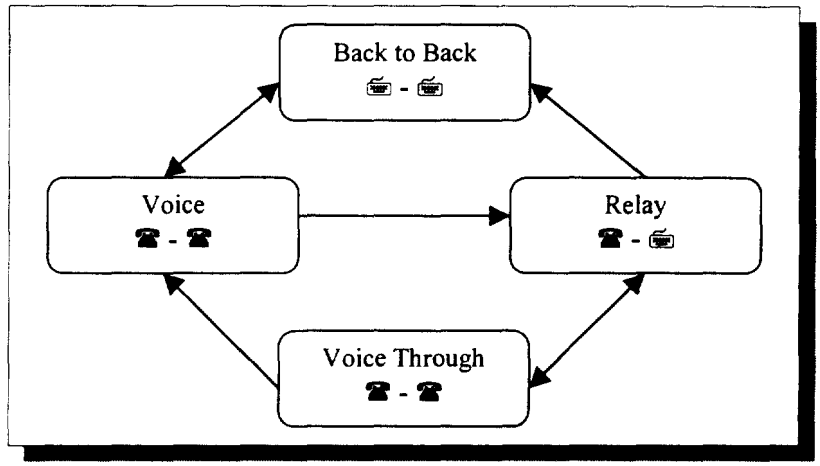
3.2.6 Connecting a Relay Call



11. If TextDirect detects a textphone answering the call it will automatically connect a relay operator into the call. The next two stages happen simultaneously while the relay operator is being connected into the call.
12. The called party is told that a relay operator is being connected and then asked for their textphone terminal type.
13. While a relay operator is being connected into the call the caller will hear a voice message telling them that the call is going to be connected via a relay operator.
14. A free relay operator is connected into the call. This relay operator will remain associated will the telephone call until they are no longer required. With the operator in place the conversation can start.

3.3 Conversation in Progress

Once a call has been established TextDirect will support four different modes or ways of communicating, each of these modes are described below. A call will stay in each mode until one or both of the telephone terminals change i.e. one party switches from text to voice or vice versa. At this point TextDirect decides which mode to move the call into dependent on the telephone terminals that are present at each end of the call. The next mode is also dependent on the previous mode as shown in the diagram.



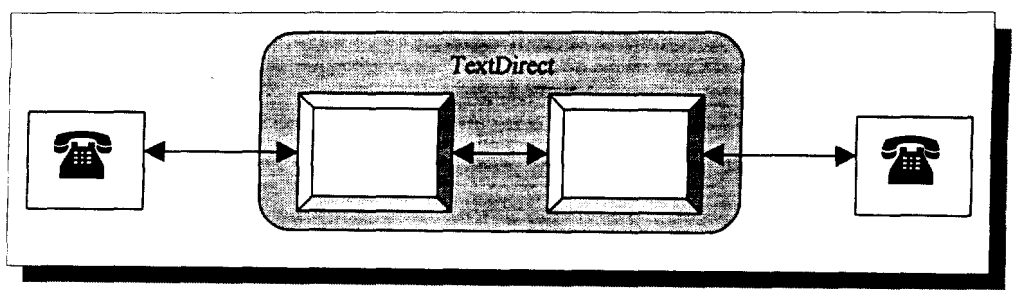
The TextDirect mode is not fixed for the duration of a call as TextDirect will allow a call to switch freely between the different modes depending on the terminal equipment being used at that moment in time. An example of this flexibility would be the following call:

User Action	TextDirect Mode
A textphone user calls a company, through TextDirect, and is answered by the switchboard operator. A Typetalk operator is connected into the call.	Relay Mode
The textphone user uses voice to talk to the switchboard operator.	Voice Through Mode
The switchboard operator puts the caller through to a voice user.	Relay Mode
The voice user switches on their textphone.	Back to Back Mode
The textphone user replies using voice.	Voice Mode

In order to give TextDirect the ability to recognise when the mode needs to change calls through TextDirect will be monitored. However, it is not the content of conversation that is monitored just the presence of text tones.

3.3.1 Voice Mode

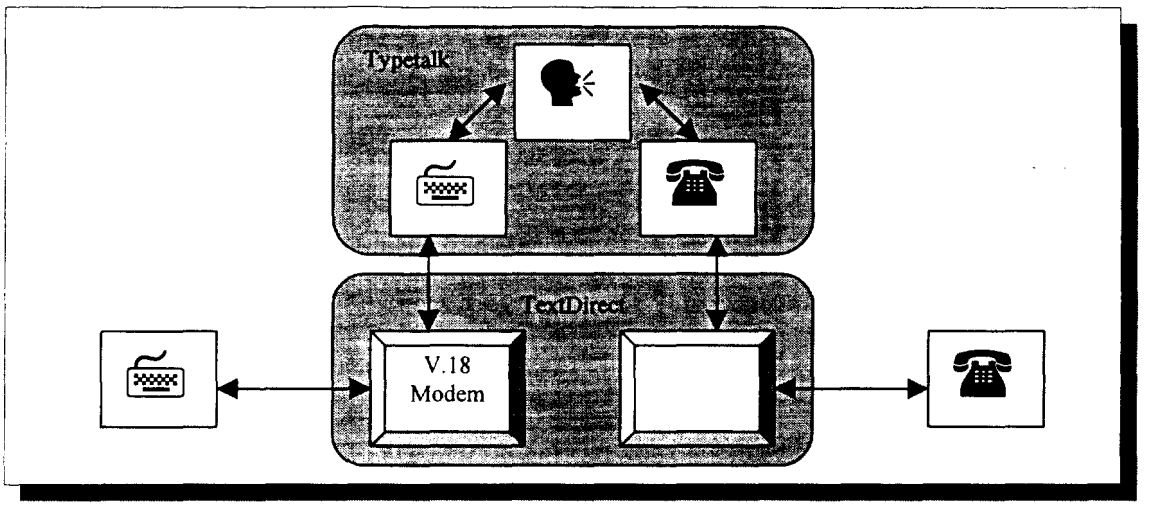
In this mode TextDirect connects the calling party directly to the called party in the same way as a call that has been dialled direct through the PSTN. Voice mode will be used when two voice users are talking to each other or when two textphone users have switched to Voice Through. The only difference between a TextDirect Voice Mode call and a call dialled direct through the PSTN is that TextDirect monitors the call for text tones and if they are present at any time during the call TextDirect will react appropriately.
From Voice Mode the call could change to Relay Mode if either party goes to text; or Back to Back



Mode if both parties go to text.

3.3.2 Relay Mode

Relay mode will be used when one party is a textphone user and the other is a voice user. Text from the textphone user is read and spoken to the voice user by the Typetalk operator. In the other direction the Typetalk operator types the spoken message from the voice user to the textphone user.
From Relay Mode the call could, if both parties go to text, go into Back to Back Mode or go into Voice

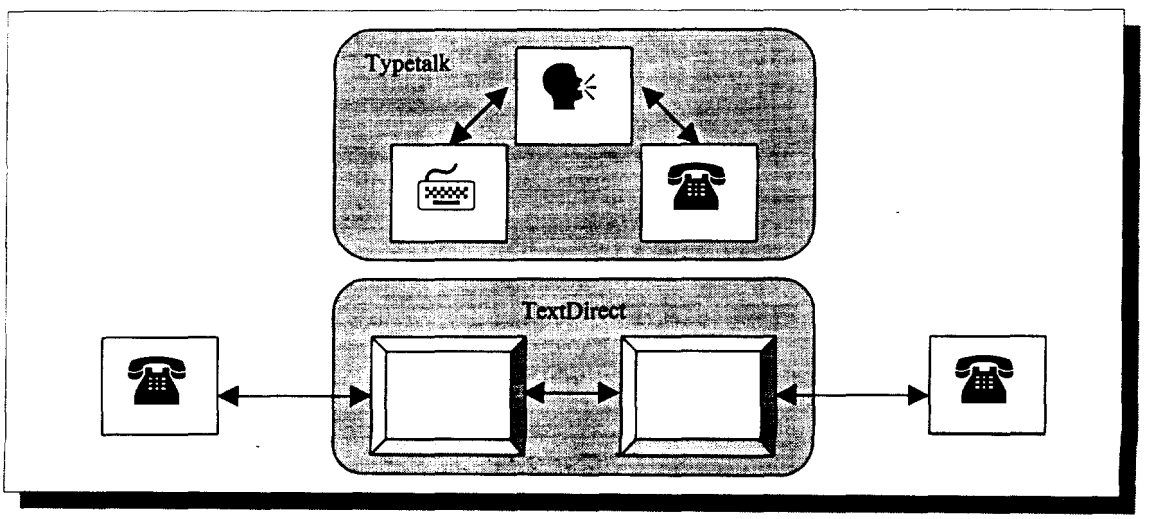


Through Mode if the textphone user goes into voice.

3.3.3 Voice Through Mode

This mode is when the conversation was going through the Typetalk operator in one direction and then the textphone user uses voice to either reply or listen. In this mode the relay operator is associated with the call but can not hear the voice communications that are taking place. When the call returns to Relay Mode the same Typetalk operator will deal with that call. They will continue to handle that call until it finishes or they are no longer required.

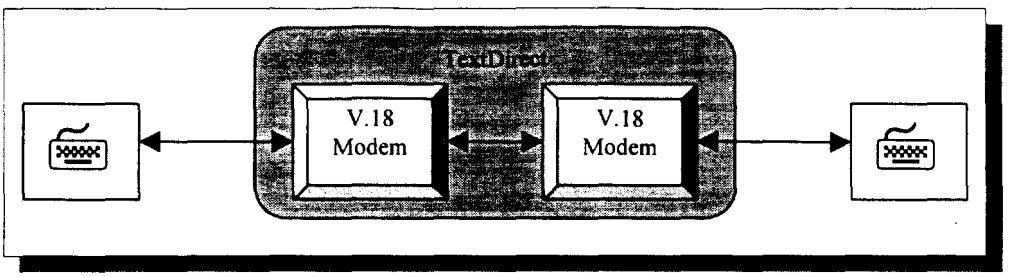
Only a call that was previously in Relay Mode can go into Voice Through Mode. From the point of view of the conversation the mode is the same as Voice Mode i.e. voices can travel in either direction. However, the difference is that a Typetalk operator is associated with the call. From Voice Through Mode the call can either return to Relay Mode or if the operator releases themselves from the call it will go into Voice Mode.



3.3.4 Back to Back Mode

When in Back to Back Mode TextDirect allows text communications to take place between two textphone users. The textphones do not have to be compatible as TextDirect provides translation between incompatible textphones. When two textphones are connected back to back through TextDirect the textphones do not actually connect to each other. Each textphone is in fact connected to

a V.18 modem and the two modems communicate with each other. Using this approach allows conversation to take place between incompatible textphones that previously were unable to communicate.



From this mode the call could change to Voice Mode if both parties change to voice or Relay Mode if one party changes to voice.

4. Billing

Important: Certain parts of the following section will only apply to BT's own customers these are marked with "***(BT)***". While the information from TextDirect about call duration and percentage of text will be made available to other Service Providers the implementation of billing and a text tariff for their customers is the responsibility of the Service Provider. Current users of Typetalk who are not BT customer will have to approach their Service Provider for information how their Service Provider will be billing for TextDirect calls.

4.1 The Changes to Billing

With TextDirect comes greater equality in the way that calls involving text communication are billed. The areas in which there will be a change are:

- One telephone bill - Once people start using the TextDirect access codes calls will appear on the telephone bill from their Service Provider. Typetalk will no longer send out telephone bills.
- Calling plans ***(BT)*** - Calls through TextDirect will appear on the caller's BT telephone bill and they will be eligible for the various discount schemes such as Friends and Family.
- Text Users' Rebate Scheme (TURS) ***(BT)*** - The current TURS process will no longer be used for text calls. Instead the calls will be charge at source using a text tariff.
- Minimum call charge ***(BT)*** - Calls through TextDirect will have the same minimum call charge as standard telephone calls, currently 5p.
- The text tariff ***(BT)*** - The text tariff will be available to all residential customers when the call made through TextDirect involves text communications.

4.2 The Text Tariff *(BT)*

With the introduction of TextDirect TURS will be replaced with a text tariff. This tariff only applies to calls made from and chargeable to a BT residential telephone line. However, both textphone and voice callers will be eligible for the tariff. This text tariff will reflect the TURS principle that calls involving text communications will on average be charged the same as a voice call. The other major change to TURS will be that users will not be required to register or claim the rebate as it will be deducted automatically at source. It will no longer be necessary to pay the telephone bill first and then claim the rebate.

The text tariff will be calculated from the standard call charge for the telephone number dialled by the customer and the percentage of the telephone call that involved text communications, i.e. the time when either one of both parties were using text. Text communications corresponds to TextDirect being in Back to Back or Relay Mode but **not** Voice or Voice Through Mode. If a call remains in Back to Back or Relay Mode for the whole duration of the call then that call will attract the full text rebate. If during the call voice is used to communicate directly between both parties, i.e. not via a relay operator, then that part of the call will be charged at the standard rate. The call charge is calculated as below:

Standard call charge - (Standard call charge * Percentage of call that is text * Text rebate)

The diagrams below give examples of telephone calls each having a standard call charge of 12p but using different modes. These diagrams show, for a given period, the mode of the call i.e. voice or text, and the call charges for that period.

1. The call is either between two textphones or via the relay and does not use Voice or Voice Through.

Back to Back or Relay Mode							
Voice or Voice Through Mode							
Standard Call Charge	2p	2p	2p	2p	2p	2p	= 12p
Text rebate	60%	60%	60%	60%	60%	60%	
Call Charge After Rebate	0.8p	0.8p	0.8p	0.8p	0.8p	0.8p	= 4.8p

With a standard call charge of 12p and a text rebate of 60% the call above would cost:

$$12p - (12p * 100\% * 60\%) = 4.8p$$

2. The call is a voice call for the whole duration.

Back to Back or Relay Mode							
Voice or Voice Through Mode							
Standard Call Charge	2p	2p	2p	2p	2p	2p	= 12p
Text rebate	0%	0%	0%	0%	0%	0%	
Call Charge After Rebate	2p	2p	2p	2p	2p	2p	= 12p

With a standard call charge of 12p and no text rebate the call above would cost:

$$12p - (12p * 0\% * 60\%) = 12p$$

3. The call uses both voice and text.

Back to Back or Relay Mode							
Voice or Voice Through Mode							
Standard Call Charge	2p	2p	2p	2p	2p	2p	= 12p
Text rebate	60%	0%	60%	0%	60%	0%	
Call Charge After Rebate	0.8p	2p	0.8p	2p	0.8p	2p	= 8.4p

This example alternates evenly between text and voice. The actual portion of the example that is eligible for the text rebate is 50% of the call.

With a standard call charge of 12p and a text rebate of 60% the call above would cost:

$$12p - (12p * 50\% * 60\%) = 8.4p$$

The standard minimum call charge, which is currently 5p, will apply to all calls.

4.3 The BT Telephone Bill (BT)

If the caller is a BT customer then charges for their TextDirect calls will appear in the Operator Services section of their BT Telephone Bill as below:

3 Operator Calls

	Date	*Time*	*Destination*		*Type of Call*	*Duration (mins:secs)*	*Cost (£)*
A	3 Dec	10:30	Ipswich	01473 320143	Op Connected	132:23	4.431
B	7 Dec	16:30		Full Rt 10.701	TextDirect		
	7 Dec	16:30		Txt 32% 2.055	TextDirect		
	7 Dec	16:30	Belfast	01232 894263	TextDirect	137:12	8.646
C	8 Dec	17:13	Belfast	01232 894263	Op Connected	12:17	2.503
D	9 Dec	14:11		Full Rt 0.998	TextDirect		
	9 Dec	14:11		Txt 0% 0.000	TextDirect		
	9 Dec	14:11	Crumlin	01849 423276	TextDirect	21:01	0.998
E	9 Dec	15:10		Full Rt 14.701	TextDirect		
	9 Dec	15:10		Txt 100% 8.82	TextDirect		
	9 Dec	15:10	Crumlin	01849 423276	TextDirect	137:12	5.88
Total Operator Calls							**24.471**

The bill above shows the Operator Services section of a BT bill. This contains the records for five telephone calls, three through TextDirect and two through the BT Operator.

Items ***A*** and ***C*** on the bill are ordinary operator connected telephone calls as they would appear now.
Item ***B*** is a call through TextDirect that has used a mix of voice and text. The first line shows the full rate for the bill i.e. the normal call charge. The second line shows the proportion of the call that was text and the amount of the rebate. It is important to note that the percentage is the proportion of call that was text and not the percentage of the rebate. The percentage of the rebate is calculated by multiplying the normal call charge by the proportion of text and by the Text User's Rebate Scheme percentage, currently 60%. The third line shows the number dialled, the call duration and the rebated call charge.
Item ***D*** is a voice call made through TextDirect. As no text was involved the call attracts the normal call charge with no discount.
Item ***E*** is a call that was either a relay or back to back for its whole duration and did not go into voice. The details are the same as item ***B*** but this time the call received the full rebate.

4.4 When Does Call Charging Start

With a standard PSTN call the call is charged from the moment the called party answers. TextDirect will also start at this point for a call in Voice Mode or Back to Back Mode. However if a relay operator is required then the call will be billed from the point when the conversation starts i.e. when the two parties have started to communicate. The caller will not be charged for the period when TextDirect is connecting the Typetalk operator or when the voice party receives the Typetalk introduction.

For calls that are answered by telephone answering machines or Interactive Voice Response (IVR) systems TextDirect will behave slightly differently. If a textphone user's call is answered in either of these ways the relay operator can release the initial call and re-dial to allow them to hear the whole message. The caller will only be charged for the second call.

4.5 Billing Enquiries

As all the billing for calls will be carried out by the caller's Service Provider any billing issues will be the dealt with by the Service Provider. Typetalk will no longer be able to provide assistance on billing enquiries.

5. Other Networks and Operators

It is BT's intention that TextDirect will be accessible to all UK telephone users regardless of which network they are calling from or to. However Service Providers may provide the facilities by other means.

5.1 UK Networks

The access codes for TextDirect have been chosen so that they will work from all UK networks. Callers will dial the same digits on every network and will have access to the same facilities. However, the arrangements for billing could differ from one network to another.

5.2 International Calls

TextDirect will allow both textphone and voice users to make calls to international telephone numbers. Calls will be made in the standard way i.e. access code followed by the international telephone number.

TextDirect will allow callers from outside the UK to call telephone numbers within the UK. In order to access TextDirect from outside the UK a caller will dial either an international text or voice telephone number for TextDirect. These will be standard UK telephone numbers that will connect the caller to TextDirect. Once connected TextDirect will ask for the UK telephone number the caller wishes to call in a similar way to the current Typetalk service. TextDirect will not allow a caller from outside the UK to make a call to a telephone number that is also outside the UK.

While TextDirect will provide compatibility between textphone protocols, that is it will allow the textphones to communicate, it will not provide compatibility between character sets so the characters typed may not be the same as the characters received at the distant end. The relay service will only be able to support those languages actually supported in the UK, currently only English, there will not be any language translation facility.

6. Other Services

6.1 Calling Line Identification

TextDirect will allow the caller's telephone number to be passed to the called party in the same way as any PSTN call. In the past a call made via Typetalk would appear as a call from Typetalk but would not give the called party any idea who actually originated the call. TextDirect will comply with the rules on not forwarding the caller's telephone number if it is withheld by the customer either permanently or just for the current call.

6.1.1 Withholding of Telephone Numbers for Current Call

As with all calls through the PSTN a caller making a call through TextDirect can withhold their telephone number if they dial 141 before the telephone number they are calling. There is a slight difference with a TextDirect call as the TextDirect Access Code is also required. For calls via TextDirect the caller will dial the appropriate TextDirect access code then '141' followed by the telephone number.

6.1.2 Withholding of Telephone Numbers Permanently

The facility to withhold the telephone number permanently is an exchange facility and is not switchable by the user.

6.1.3 Forwarding a Telephone Number for One Call

If a telephone line has the number permanently withheld then the user may for the current call forward their telephone number by dialling '1470' before the telephone number they are calling. As with the '141' this should be dialled between TextDirect access code and the telephone number.

6.2 Caller Display Equipment

The current caller display equipment is unaware of TextDirect. If the equipment has a dial facility this should not be used for text calls as the calls will not be prefixed with the TextDirect access code.

6.3 Caller Return

The Caller Return (1471) service tells customers the telephone number of the last person that called them and when they called. It also gives the customer the option to ring the caller back by pressing the digit '3'.

TextDirect provides its own equivalent of Caller Return for textphone users. It is important to note that the telephone number returned by TextDirect Caller Return will be the last number to call through TextDirect. This could be different to the last number that called direct i.e. without going through TextDirect.

As with all calls the textphone user will dial the TextDirect access code followed by the number they want, in this case '1471'. TextDirect will respond, in text, with the telephone number and the option to dial that number.

6.4 Text 999 112 Emergency Calls

The new text emergency number will be 18000, this will replace the current 0800 112999 number. This will be dialled without a TextDirect prefix. The call is still routed through TextDirect however it will be handled in a slightly different way. A standard call through TextDirect will wait until the called party answers and then decide whether or not a relay operator is required. With an emergency call TextDirect knows that a relay operator is required and it will simultaneously connect a relay operator into the call while it is connecting to a BT Emergency Operator. Should the situation arise where there is no relay operator is available then the emergency call takes priority over all other calls and a relay operator will be made available. If, for whatever reason, a relay operator could not be connected into a call then the call will still be connected to the BT Emergency Operator who will have the relevant CLI and contact information for the caller.

If a caller should dial the TextDirect Text Access Code followed by either 112 or 999 the call will still be connected through in the same way as a 18000 call. The only difference being that with the 18000 code the PSTN knows from the start that it is an emergency call and it will be connected as such.

6.5 The 100 Operator

Calls to the 100 operator are handled the same way as ordinary TextDirect calls with the relay being connected into the call when the 100 operator answers. Textphone users will dial 18001100 to connect to the operator.

6.6 Directory Enquiries (192)

Directory Enquiry calls will be connected to a text version of the Directory Enquiry service. Textphone user will dial the 18001192. These calls will be changed at the normal 192 rate.

6.7 Free Directory Enquiries (195)

The '195' service is for people who can not use the paper phonebook because of a disability.
If a textphone user is eligible for this service they will need to register for the Free Directory Enquiries, if not already registered. Once they have registered they will then dial 18001195.

6.8 IVR and Answer Machines

Interactive Voice Response (IVR) systems, call steering and answer machines all pose the same problem to TextDirect. With these systems there is the possibility of a voice message being sent by the system before the Typetalk operator has been connected into the call. TextDirect will use two strategies to over come the problem, release and redial or flagging.

6.8.1 Release and Redial

If a Typetalk operator is connected into a call and some form of voice message has been partial transmitted by the called party then the relay operator will have the option to release and redial so that they can hear the complete message. The caller will not be charged for the first connection they will instead be charged from the start of the re-connection.

6.8.2 Flagging IVR systems

The second approach that will be used with the ever-increasing number of IVR systems is for TextDirect to flag such system so that a Typetalk operator can be connected into the call before the second leg to the call is made. This will result in the relay operator being able to hear the complete message without the need to re-dial.

6.9 Carrier Pre-Selection

In order to use a Carrier Pre-Selection service the access codes for that service will have to be dialled before the appropriate TextDirect access code.

6.10 Call Barring

There is the facility on modern telephone lines to stop certain types of call being made i.e. calls to Premium number, international, etc. TextDirect will honour this barring for calls from the BT Network. The same should be true for customers of other network providers however it is dependent on the information being available to TextDirect.

6.11 Incoming Call Facilities

TextDirect has no effect on the way that the called telephone number will handle incoming calls. Facilities that affect incoming calls to a telephone line such as Call Diversion, Choose to Refuse and Call Sign will function in their normal way. If calls to a telephone number are diverted to another number then a call from TextDirect will also be diverted. If the caller dialled a TextDirect access code followed by the Call Sign telephone number then the call will ring using the Call Sign ring.

7. Glossary Of Terms

ADSL	Part of the Digital Subscriber Line family delivering high data connection to the home
Back to back	Two textphones users communicating in text
Called party	Person receiving the telephone call
Calling party	Person who initiated the telephone call
CCITT	The international body that recommends protocols for communications. The organisation is now called the ITU. Also used by textphone manufacturers to describe the V.21 protocol.
Distant End	The telephone at the other end of the call
DTMF	Tones produced by modern telephone when dialling
Hearing Carry Over (HCO)	See Voice Through
ISDN	Digital phone line
ITU	International Telecommunications Union recommends communications protocols.
IVR	Interactive Voice Response – a computer system that uses voice messages and voice or DTMF responses to perform an operations i.e. switch the call to an operator in the case of call steering.
PSTN	Public Switched Telephone Network
Second Leg	The part of a telephone call from TextDirect to the Called party
Text communications	Communication between two parties using text as specified in ITU-T V.18
Textphone	A device with keyboard and screen that communicates over the PSTN using tones
TURS	The Text Users' Rebate Scheme. The scheme provides a rebate for calls from domestic telephone lines that involve text communications.
Typetalk	Typetalk is the UK's National Text Relay Service managed by the Royal National Institute for Deaf People and funded by BT.
V.18	The textphone protocol that specifies text communication between textphones
Voice Carry Over (VCO)	See Voice Through
Voice Through	When a textphone user uses voice to communicate in one direction. This could be either a person who is deaf with a good voice speaking their reply or a person who is speech impaired listening to a reply. These are also called Voice Carry Over and Hearing Carry Over respectively.

8. Document Information

8.1 History

Date	Issue	Comment
1 February, 2000	Draft 1.0	For comment
29 February, 2000	Draft 2.0	Addition of access codes, new name and bill details
9 March, 2000	Draft 3.0	Rewording
10 March, 2000	Draft 4.0	Incorporated corrections
3 April, 2000	Issue 1	

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